

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD  
*SOUTH DAKOTA SUPPLEMENTS ITALICIZED***

**FILTER STRIP**

(ac.)

**CODE 393A**

**DEFINITION**

A strip or area of vegetation for removing sediment, organic matter, and other pollutants from runoff and wastewater.

**PURPOSES**

To remove sediment and other pollutants from runoff or waste water by filtration, deposition, infiltration, absorption, adsorption, decomposition, and volatilization, thereby reducing pollution and protecting the environment.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies: on cropland or grazingland at the lower edge of fields or above conservation practices such as terraces or diversions, or on fields adjacent to streams, ponds, and lakes; in areas requiring filter strips as part of a waste management system to treat polluted runoff; and on forest land where filter strips are needed, as part of a forestry operation, to reduce delivery of sediment into waterways.

**CRITERIA**

**General Criteria Applicable to All Purposes**

*The application of this practice will comply with all federal, state, or local laws.*

*Filter strips will be placed in areas receiving primarily overland sheet flow.*

*Plants selected for filter strips should be actively growing during the expected runoff period,*

*Plant species must be selected according to the type and quantity of pollutant contained in the runoff and to the growth condition during the time of the year that the pollutant can be expected to move as overland flow. (An example of proper*

*species selection would be to select atrazine tolerant species if atrazine is applied to the contributing watershed.)*

*Plant species should be selected that have stiff, upright growth characteristics for flow retardance and pollutant filtering. Plants must remain upright during flow events.*

*Criteria for establishment (plant suitability, seedbed preparation, seeding depth, weed control, etc.,) of vegetation will be consistent with South Dakota Standard 512 (Pasture and Hayland Planting). The species composition (minimum of two species) and seeding rates will be selected from Table 1, page 4, of this standard.*

*The selected plant species must be compatible with other objectives of the landuser.*

No plants listed on the noxious weed list of the state will be established in the filter strip.

**Additional Criteria for Filter Strips for Trapping Sediment and Related Pollutants.**

These criteria apply to filter strips on cropland at the lower edge of fields, on grazingland, or in manure spreading areas adjacent to streams, ponds, and lakes, and above conservation practices such as terraces or diversions.

***Sediment Trapping***

The length of flow through vigorous vegetation for trapping sediment shall be at least 20 feet for slopes of less than 3 percent, 25 feet for sloped 3-10 percent and 30 feet for slopes greater than 10 percent. The width shall be proportionately wider for steeper slopes and/or less permeable soils.

***Related Pollutants***

*The length of flow through vigorous vegetation to remove pollutants such as nutrients and pesticides*

Conservation practice standards are reviewed periodically and updated if needed. The current version of this standard is posted on our website at [www.sd.nrcs.usda.gov](http://www.sd.nrcs.usda.gov) or may be obtained at your local Natural Resources Conservation Service.

*shall be at least 50 feet for slopes of less than 3 percent, 75 feet for slope 3-10 percent, and 100 feet for slopes greater than 10 percent. The width shall be proportionately wider for steeper slopes and/or less permeable soils.*

#### **Additional Criteria for Filter Strips for Runoff from Concentrated Livestock Areas**

These criteria apply to filter strips *for cropland or grazingland areas or for feedlot and barnyard runoff.*

*Filter strips designed for land use areas that do not meet the definition of a Animal Feeding Operation (AFO) or Concentrated Animal Feeding Operation (CAFO) will have design widths as identified in the preceding criteria for removing related pollutants.*

#### **Filter Strips as a Component of Agricultural Waste Management Systems (AWMS)**

Filter strips may be used as a component of AWMS. Additional conservation practices such as diversions, settling basins, or low velocity channels shall be *part of an AWMS in addition to a filter strip* when more than 50 1,000-pound animal units are confined. *Additional conservation practices should be considered for use with all filter strips.*

*If filter strips are used in conjunction with an AFO or CAFO the application will be consistent with federal, state, and local laws concerning these operations.*

*Filter strips by themselves will not meet the “no-discharge” requirement applicable to livestock operations requiring permits under the National Pollutant Discharge Elimination System.*

*The length of flow through vigorous vegetation to remove pollutants from feedlot or barnyard runoff shall be at least 60 feet for slopes of less than 2 percent, 90 feet for slopes 2 to 4 percent, 120 feet for slopes 5 to 6 percent. Filter strips are not recommended for slopes greater than six percent. The width shall be proportionately wider for steeper slopes and/or less permeable soils. In addition, filters are only permitted on slopes less than two percent if solids are periodically removed over the confinement period or a removal system such as a sediment basin is functioning above the filter, the cross slope of the filter area is nearly flat, and the effluent water can evenly spread over the top of the filter area.*

#### **Additional Criteria for Filter Strips on Forestland.**

These criteria apply to filter strips for runoff as part of a forestry operation to reduce delivery of sediment into waterways.

As a guide, the length of flow through undisturbed forest floor should be at least 20 feet for slopes of less than 1 percent and proportionately up to at least 65 feet for 30 percent slopes and at least 150 feet for 70 percent slopes. Longer flow lengths should be used as contributing drainage areas increase.

### **CONSIDERATIONS**

Evaluate type and quantity of pollutant, slopes and soils, adapted vegetative species, time of year for proper establishment of vegetation, necessity for irrigation, visual aspects, fire hazards, and other special needs.

Prevent erosion where filters outlet into streams or channels.

*When filters are designed to enhance wildlife habitat, plant species diversity should be encouraged.*

If filter strips are to be used in treating polluted runoff from concentrated livestock areas, the following must be considered:

*The filter strip area should have adequate soil drainage to ensure satisfactory performance.*

*To adequately protect groundwater resources filter strips should not be placed over shallow aquifers.*

*The effectiveness of filter strips is substantially reduced under snow or frozen conditions.*

*Provisions for excluding roof water and unpolluted surface runoff should be considered in all AWMS.*

*Provisions for mowing and removing vegetation to maintain the effectiveness of the filter area.*

*Controlled grazing may be satisfactory when the filter area is dry and firm.*

*More stringent pollution abatement measures may also be necessary where receiving waters must be highly protected.*

## OPERATION AND MAINTENANCE

Development of rills and small channels within filter areas must be minimized. Needed repairs must be made immediately to reestablish sheet flow. A shallow furrow on the contour across the filter can be used to reestablish sheet flow. Vegetation must be maintained in a vigorous condition. *Filter areas should be mowed or grazed periodically (every two to five years) to maintain plant vigor. Mowing or grazing should be done during the growing season when traffic will not damage the filter and the likelihood of an erosive rainfall is low. If livestock have access to the filter area, it must be fenced to control grazing. Where grazing is used for maintenance, grazing will be done with high animal densities for a short period of time, i.e., five to six AU's/acre, for three to five days.*

## PLANS AND SPECIFICATIONS

*Specifications for establishment and maintenance of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, And Operation and Maintenance described in this standard.*

*Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.*

**TABLE 1**  
**SEEDING COMPOSITION AND RATES <sup>1/</sup>**

*All Technical Guide Areas*

	<i>PLS lbs per acre for a full seeding</i>	<i>Number of seeds per PLS Pound</i>
<b><i>Native Grasses</i></b>		
<i>Big bluestem</i>	7.9	165,000
<i>Indiangrass</i>	7.5	175,000
<i>Reed canarygrass</i>	2.4	540,000
<i>Sand bluestem</i>	13.1	100,000
<i>Switchgrass</i>	3.4	389,000
<i>Western wheatgrass</i>	11.9	110,000
<b><i>Native Legumes</i></b>		
<i>Illinois Bundleflower</i>	21.8	60,000
<i>Purple prairieclover</i>	4.5	290,000
<i>White prairieclover</i>	3.4	384,000
<i>Canada milkvetch</i>	4.9	266,000
<b><i>Introduced Grasses</i></b>		
<i>Creeping foxtail</i>	1.5	900,000
<i>Intermediate wheatgrass</i>	14.9	88,000
<i>Pubescent wheatgrass</i>	13.1	100,000
<i>Tall wheatgrass</i>	16.5	79,000
<b><i>Introduced Legumes</i></b>		
<i>Alfalfa</i>	6.2	210,000
<i>Alsike clover</i>	1.9	680,000
<i>Birdsfoot Trefoil</i>	3.1	418,000
<i>Cicer milkvetch</i>	9.0	145,000
<i>Sainfoin</i>	43.6	30,000

<sup>1/</sup>The composition of a seeding will be at a minimum of two grass species with the exception of Reed canarygrass or Creeping foxtail which may be seeded as a single species.

The minimum amount of a species in any mix is 10 percent.

Legumes will not occupy more than 10 percent in any mix.